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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/845,566	04/30/2001	Jeffery J. Hanson	S697.12-0051	2220
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KINNEY & LANGE, P.A. THE KINNEY & LANGE BUILDING 312 SOUTH THIRD STREET MINNEAPOLIS, MN 55415-1002			EXAMINER [REDACTED]	DEL SOLE, JOSEPH S
			ART UNIT 1722	PAPER NUMBER 5

DATE MAILED: 05/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	09/845,566	
Examiner	HANSON ET AL.	
Joseph S. Del Sole	Art Unit 1722	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-21 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-21 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All
 - b) Some *
 - c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 - a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____.
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>4</u> .	6) <input type="checkbox"/> Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Specification

2. The disclosure is objected to because of the following informalities: a) "In a an extrusion" at line 8 of page 2 should be changed to --In an extrusion--; b) "while is being built" at line 14 of page 3 should be changed to --while it is being built--.

Appropriate correction is required.

Claim Objections

3. Claims 2 and 13 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The thermal diffusivity of the road is a limitation dependent on the material shaped by the apparatus, but does not further limit the apparatus and therefore does not further limit the subject matter of the previous claim. Likewise, the transit time, does not further limit because it is dependent on the thermal diffusivity.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 1-5, 12-14, 16-17 and 20-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Crump (5,340,433).

Crump teaches a modeling machine/ extrusion apparatus having a first dispenser (Fig 6, #151 and Fig 11, #127) carried by an extrusion head (Fig 3, #4) and having an inlet and a tip (Fig 11) for dispensing material, the tip of the first dispenser having a downward face positioned in approximately a z-plane; a second dispenser (Fig 6, #152 and Fig 11, #127) carried by the extrusion head and having an inlet and a tip, the tip of the second dispenser being maintained in a fixed vertical position relative to the tip of the first dispenser (Fig 6 and Fig 11), and having a downward face spaced apart a

distance from the face of the first dispenser and positioned in approximately the same z-plane as the face of the first dispenser; a third dispenser (Fig 11, #127) carried by the extrusion head and having an inlet and a tip, the tip of the third dispenser being maintained in a fixed vertical position relative to the tips of the first and second dispensers (Fig 6 and Fig 11), and having a downward face spaced apart a distance from the face of the first and second dispensers and positioned in approximately the same z-plane as the face of the first and second dispensers; wherein the distance s is great enough that a road deposited by one of the tips will shrink due to cooling during a minimum transit time $\delta(t)$ between the tips such that the other one of the tips does not drag across and smear the road (the extent of shrinking, due to thermal diffusivity, along with the transit time are method limitations that do not structurally define the apparatus, the apparatus taught by Crump has a distance capable of achieving this if operated in an appropriate method); the apparatus is capable of accelerating and decelerating through a path having multiple vertices (Fig 1) and is capable of being accelerated or moved at a velocity such that the spacing of the tips is greater than or equal to the relationship of claim 3 since the relationship is also dependent on the material shaped, which is a method limitation and the selection of a material shaped does not define the structure of the apparatus; the dispensers are thermally conductive (Fig 8, lines 7-25); a thermally conductive body in which the dispenser are carried (Fig 8, lines 7-25); a means carried by the body for heating the dispenser to a temperature at which the first and second materials are flowable (Fig 3, #92); each of the dispensers

comprise an elongated tubular member that terminates in a common nozzle which carries both tips (Figs 6 and 11).

6. Claims 1-5 and 16-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Tseng (6,030,199).

Tseng teaches a modeling machine/ extrusion apparatus having a first dispenser (Fig 1, the dispenser for #40) carried by an extrusion head (Fig 1, the head having #s 26 and #28) and having an inlet (Fig 1, when #16 is removed it is an inlet) and a tip (Fig 1, #26) for dispensing material, the tip of the first dispenser having a downward face positioned in approximately a z-plane; a second dispenser (Fig 1, the dispenser for #42) carried by the extrusion head and having an inlet and a tip, the tip of the second dispenser being maintained in a fixed vertical position relative to the tip of the first dispenser (Fig 1), and having a downward face spaced apart a distance from the face of the first dispenser and positioned in approximately the same z-plane as the face of the first dispenser; wherein the distance s is great enough that a road deposited by one of the tips will shrink due to cooling during a minimum transit time $\Delta(t)$ between the tips such that the other one of the tips does not drag across and smear the road (the extent of shrinking, due to thermal diffusivity, along with the transit time are method limitations that do not structurally define the apparatus, the apparatus taught by Tseng has a distance capable of achieving this if operated in an appropriate method); the apparatus is capable of accelerating and decelerating through a path having multiple vertices (Fig 1) and is capable of being accelerated or moved at a velocity such that the spacing of the tips is greater than or equal to the relationship of claim 3 since the relationship is

also dependent on the material shaped, which is a method limitation and the selection of a material shaped does not define the structure of the apparatus; the dispensers are thermally conductive (col 4, lines 46-63); a thermally conductive body in which the dispenser are carried (col 4, lines 46-63); a means carried by the body for heating the dispenser to a temperature at which the first and second materials are flowable (Fig 1, #20); each of the dispensers comprise an elongated tubular member that terminates in a common nozzle which carries both tips (Fig 1).

7. Claims 1-4 and 16-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Yang et al (6,280,784 B1).

Yang et al teach a modeling machine/ extrusion apparatus having a first dispenser (Fig 4, #188A) carried by an extrusion head (Fig 4, #180) and having an inlet (Fig 4, #184A) and a tip (Fig 4, #186A) for dispensing material, the tip of the first dispenser having a downward face positioned in approximately a z-plane; a second dispenser (Fig 4, #188A) carried by the extrusion head and having an inlet and a tip, the tip of the second dispenser being maintained in a fixed vertical position relative to the tip of the first dispenser (Fig 4), and having a downward face spaced apart a distance from the face of the first dispenser and positioned in approximately the same z-plane as the face of the first dispenser; wherein the distance s is great enough that a road deposited by one of the tips will shrink due to cooling during a minimum transit time $\delta(t)$ between the tips such that the other one of the tips does not drag across and smear the road (the extent of shrinking, due to thermal diffusivity, along with the transit time are method limitations that do not structurally define the apparatus, the apparatus taught by

Yang et al has a distance capable of achieving this if operated in an appropriate method); the apparatus is capable of accelerating and decelerating through a path having multiple vertices (Fig 1) and is capable of being accelerated or moved at a velocity such that the spacing of the tips is greater than or equal to the relationship of claim 3 since the relationship is also dependent on the material shaped, which is a method limitation and the selection of a material shaped does not define the structure of the apparatus; the dispensers are thermally conductive (col 9, line 64 - col 10, line 4); a thermally conductive body in which the dispenser are carried (col 9, line 64 - col 10, line 4); a means carried by the body for heating the dispenser to a temperature at which the first and second materials are flowable (col 9, line 64 - col 10, line 4).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 6, 8-10 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crump (5,340,433).

Crump teaches the apparatus as discussed above pertaining to one embodiment of Crump including, as discussed, a thermally conductive body in which the dispensers are carried; a means for heating the first dispenser and the second dispenser, and the aforementioned mathematical relationships of the minimum transit time and the spacing.

The above embodiment of Crump fails to teach thermal insulator positioned in the body so as to provide thermal separation between the dispensers, wherein the thermal insulator is a solid material.

A second embodiment of Crump teaches the use of a solid material insulator (Fig 13, #240) positioned in the body to provide thermal separation between dispensers for the purpose of selectively utilizing the nozzles for the proper dispensing of the particular supply of material being used and the type of device being modeled or prototyped (col 12, lines 27-44).

It would have been obvious to one having ordinary skill in the art at the time of the Applicant's invention to have modified the first embodiment of Crump with a solid material insulator positioned between dispensers as taught by the second embodiment of Crump because it enables the selective utilization of the nozzles for different materials.

12. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crump (5,340,433) in view of Taylor (3,993,967).

The first and second embodiments of Crump in combination teach the apparatus as discussed above.

Crump fails to teach the thermal insulator being ambient air that fills a cavity in the body.

Taylor teaches nozzles in passages that are larger in diameter than the nozzles to provide air insulating spaces (col 9, lines 48-61).

It would have been obvious to one having ordinary skill in the art at the time of the Applicant's invention to have modified the invention of Crump by utilizing excess space between nozzles and the passages that they are within as taught by Taylor because air is well known insulator that would not break down in the same fashion that a solid material insulator would.

13. Claims 11, 15 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crump (5,340,433) in view of Heller et al (5,358,673).

Crump teaches the apparatus as discussed above.

Crump fails to teach the distance s being at least 0.02 inches.

Heller et al teach a distance s between dispensers being at least 0.02 inches (col 15, line 5) for the purpose of achieving favorable results in the layering of materials (col 14, line 24 - col 15, line 33).

It would have been obvious to one having ordinary skill in the art at the time of the Applicant's invention to have modified the invention of Crump with a distance s between dispensers of at least 0.02 inches as taught by Heller et al because it achieves favorable results in the layering of materials.

References of Interest

14. Barnard (2,565,941), Barlage, III et al (5,784,279), STRATASYS, INC (EP 0426363A2) and Japanese Patent 61-94722 are cited of interest to show the state of the art.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph S. Del Sole whose telephone number is (703) 308-6295. The examiner can normally be reached on Monday through Friday from 8:30 A.M. to 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Wanda Walker, can be reached at (703) 308-0457. The official fax phone number for the organization where this application or proceeding is assigned is (703) 872-9310 for non-after finals and (703) 872-9311 for after finals.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Joseph S. Del Sole

J.S.D.
April 29, 2003

Robert Davis
ROBERT DAVIS
PRIMARY EXAMINER
GROUP 1300 1722

5/2/03